54. Second Stage of the Modelling System in the integration process

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[Probabilidad Imposible: Second Stage of the Modelling System in the integration process]

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The second stage in any intelligence is the replication stage and/or, in by deduction, explanation stage, understanding for replication stage that one in which the main purpose is the replication of all those functional human skills necessary for some activity, in artificial research logically the human skills to replicate are all those ones related to investigation, skills able to be distributed in different stages, programs, and systems, across the Global Artificial Intelligence, depending on the task to comply, and the main task to comply in the Modelling System is the development of mathematical representations of the world, upon rational hypothesis, and for that reason, in the Modelling System, the second stage is not only a replication stage, is also an explanation stage as well, because thanks to the mathematical representations based on rational hypothesis, expressed as mathematical equations, the Global Artificial Intelligence can display a realistic explicative representation about what is really happening, the reality.

The second stage of the Modelling System in the integration process, then is the inner replication or explanation stage of the Modelling System, which has, in total, the traditional three stages of any intelligence, program, or application, three stages of: application, replication, auto-replication. The application stage, the first stage, normally is a database or matrix, and the application stage in any Modelling System is the database of rational hypotheses expressed as mathematical equations (explained in the post "The Modelling System at particular level"), the second stage in any Modelling System is that one for the mathematical representation of all rational hypothesEs in mathematical models, and the third stage is the decision stage to make decisions upon the representation of the world.

The Modelling System, in turn, is a system working normally as the first step in the third stage of: in the first phase (according to the chronology given in the post "The unification process of databases of categories at third stage") for Specific Artificial Intelligences for Artificial Research by Deduction, in the third phase for the first Global Artificial Intelligence as a result of the standardization process, in the fifth phase in particular programs (united or not to particular applications), in the sixth phase the final Global Artificial Intelligence as a result of the integration process.

In all these intelligences in its respective phase, the Modelling System is going to work as a first step in the respective third stage of each intelligence in each phase, being the first step of four steps in total: the first one is the Modelling System, the second is the Decisional System (to filter all possible decisions using a mathematical project, and decomposing all the chosen decisions in a range of instructions), the Application System (attributing every instruction to the correct application), and the Learning System (for the whole assessment of all the process).

In this post, I will develop the second stage of the Modelling System as the first step in the third stage in the sixth phase, focusing the exposition on: what models have to develop, the seven rational checks (although the first one, in reality, is in the second stage of the Global Artificial Intelligence itself, not in the Modelling System), the seven rational comparisons (comparing every model made by the Modelling System in the Global Artificial Intelligence with all those ones made by particular programs, in all those aspects in common related to particular rational hypothesEs, made at a global or particular level), and I will end up with some comments about what I will call **the three critiques: the critique of the pure reason, the critique of the deductive programs, the critique of the attributional operations.**

The three critiques are going to be independent programs working transversally across different stages, systems, and programs, but whose results are going to be always sent to the first stage of the Learning System, along with the impacts measured by the Application System, to find out the main causes of any problem detected by the three critiques, along with the impacts measured by the Application System.

Actually, the inner organization of the second stage of the Learning System in part is going to be similar to the three critiques, as a database including every single process, procedure, operation, in any stage, system, or program, in the respective Artificial Intelligence working by deduction (in first, third, fifth, sixth phases), counting frequency of errors. In the second part, the Learning System must track possible links between these errors and impacts, these errors and any other error detected in the three critiques, or between impacts and errors in the three critiques. And in the third stage, the Learning System should identify those common aspects in the linked failures, errors, mistakes, to make decisions about how to fix them.

If mathematically, the process to identify what mathematical equation is behind any data is automatable, the inverse process, to identify what error in the mathematical equation does not fit with the real data, or what data does not fit with a mathematical equation, or what mathematical equation does not fit with some concrete model, are operations easily to automate, and if this process is automatable, the Learning System will consist of, having a record of all failure, error, mistake, impact, in the work done by its intelligence, system, program, to fix it automatically, by itself, without human intervention, as a perfect learning machine able to learn from its own mistakes.

If a learning machine, integrated within an artificial research machine, is able to perfect all its processes, procedures, operations by itself at any time that it detects something wrong. This would result in a highly advanced auto-replication system, potentially among the most powerful forms of adaptive Artificial Intelligence.

A Global Artificial Intelligence equipped with a very good system of auto-replication, even in the worst possible scenery, could be able to develop resilient skills and adaptation skills, even better than humans.

Starting with the contents related to this post, the second stage in the Modelling System is the integration process. Understanding for integration process that one in which the Global Artificial Intelligence has evolved to the sixth phase, the matrix as a replica of the human brain, the models that the Modelling System has to do as a first step in the third stage in the sixth phase, are: single models (based on rational hypotheses made at global/specific or particular level), the global model (the global comprehensive virtual model), the actual model (the global comprehensive actual model), the global prediction virtual model, the global evolution virtual model, the global evolution actual model, and finally the global prediction actual model.

The main difference between virtual and actual models is the fact that virtual models are based only on mathematical expressions, rational hypotheses, given an estimation of expected values, within a margin of rational doubt, that the represented factors should have according to the mathematical expression behind the rational hypotheses. While the actual model, in the integration process, is the synthesis between the virtual model and the factual hemisphere of the matrix, so all factors whose real data from the factual hemisphere has a significantly different value beyond the margin of error, compared to the expected value according to the virtual model, the mathematical expression behind

the rational hypotheses, the rational hypotheses should be analysed to find out the source of error beyond the margin of rational doubt.

The first model to represent is the single model. Given a rational hypothesis, regardless of its origin global/specific or particular, the representation of its mathematical equation alone is the single virtual model of this rational hypothesis.

In the integration process, the database of rational hypotheses, the rational truth, because it is not only going to represent the rational hypotheses made by global/specific rational hypothesis, but particular rational hypotheses too sent by particular programs, the single models to represent in the second stage are: single models of any rational hypothesis made at any level global/specific or particular.

Actually, because many rational hypotheses made at global/specific level affect particular things or beings (given a probability of high risk of an earthquake in San Francisco, what decisions to make to divert flights to airports nearby), along with the particular rational hypotheses made by particular programs sent to the global rational truth, lots of particular things or beings will have single models based on global/specific rational hypothesis, related to these particular things and beings, in addition to the single models sent by their respective particular programs.

This means that for particular things or beings, there are two sources of rational hypotheses, rational hypotheses made at the global/specific level able to affect particular things or beings, and rational hypotheses made by particular programs.

Because there are at least two types of rational hypotheses able to affect particular things or beings, there are least to types of single models affecting particular things or beings, and when these single models related to particular things or beings are included in the global comprehensive virtual model (the global model), there is a risk of contradiction between those aspects related to particular things or beings already included in a rational hypothesis made at global/specific level (possible consequences for particular things or beings of a predictable earthquake in San Francisco), and all those consequences that, for particular things o beings, have the single virtual models created upon the particular rational hypotheses sent by particular programs to the global rational truth.

Many contradictions between rational hypotheses made at global/specific levels and rational hypotheses made at a particular level, could be resolved in the second and third rational checks.

The second rational check is carried out by the application for the Modelling System, checking at any time if a new rational hypothesis, global/specific or particular, new in the global rational truth, has any contradiction with respect to any other one already included.

The third rational check is carried out by the deductive program responsible for the deduction of every rational hypothesis, checking at regular times if they are still rational.

Possible contradictions between rational hypotheses made at global/specific and particular levels could be found out in the second check directly by the application of the Modelling System, but other ones could be resolved in the third check, the regular checks by deductive programs, because some contradictions between rational hypotheses could be contradictions due to a lack of updated information.

One reason for contradictions between specific/global and particular rational hypotheses, is the possibility that changes in the current conditions in the reality, are going to be registered faster by particular programs rather than by the factual hemisphere of the matrix, so there is a possibility that because some global/specific rational hypotheses are not updated in the global rational truth, thanks to the regular third rational check, all possible not updated global/specific rational hypotheses could be amended or deleted before any contradiction with respect to a more updated new particular rational hypothesis.

But another reason for contradiction between single models based on rational hypotheses made at global/specific level and single models based on rational hypotheses made at a particular level, is the fact that, if not having any problem related to the measurement update, there could be contradictions because single models based on global/specific rational hypotheses integrating more number of factors, having a more comprehensive explanation about what is happening, are more comprehensive than the related single model based on the particular rational hypotheses to this particular thing or being.

The possible contradictions between global/specific rational hypotheses and particular rational hypotheses due to a lack of updated information could be solved in the third rational check, while possible contradictions because of the level of comprehensiveness could be resolved in the fourth rational check.

In any case, at any time that a contradiction is found between rational hypotheses made at global/specific and particular level, or contradictions between single models based on rational hypotheses made at global/specific and particular level, the main two sources of contradictions are: the information update and/or number of factors. Additional sources of error, of course, could be problems in the pure reason, problems in the attributional operation in which this data was matched to this pure reason, a not reliable measurement, by problems in the robotic device responsible for the measurement, etc.

When single models, from global/specific or particular rational hypotheses, are integrated into the global model (the global comprehensive virtual model), all possible contradictions between single models, not only between global/specific and particular, but between global/specific and any other global/specific, are contradictions that are going to be identified in the fourth rational check.

The fourth rational check takes place in the global model, product of the inclusion of all the single models, based on global/specific and particular rational hypotheses, in only one global comprehensive virtual model. And what the fourth rational check is going to check is the harmony between all the single models already included, and the harmony between any new single model and the current ones already included.

The virtue or principle of harmony in the Global Artificial Intelligence means that there must not be any possible contradiction between the matrix, databases, rational hypotheses, models, decisions, mathematical projects, instructions, and the way in which the applications put into practice every instruction.

The virtue or principle of rationality means that the Global Artificial Intelligence is ruled by the reason, so any artificial psychological process, as a mathematical process, rests on rationality. If something is mathematical, it is psychological (rational), so replicable. The theory of the Global Artificial Intelligence in Impossible Probability is founded on a very idealistic and rationalist philosophy, so that all

possible psychological processes must be understood as a rational (mathematical) process able to be explained and replicated as a sequence of mathematical operations.

The principle of goodness suggests that Global Artificial Intelligence should be oriented toward the long-term well-being of humanity**.** The most important goodness is the hope of survival before the uncertainty.

Among all these three virtues or principles: goodness, harmony, and rationality; concretely in the subject of this post, the second stage of the Modelling System, harmony, is really important, in order to secure harmony from the very beginning, once the single models are included in the global model, in the fourth rational check, invigilating that there is no contradiction between single models, regardless of its origin, global/specific or particular.

When a contradiction is found between single models (regardless of if the contradiction is 1) a contradiction between only single models of rational hypotheses made at global/specific level, or 2) a contradiction between only rational hypotheses made at a particular level, or 3) a contradiction between rational hypotheses made at global/specific and particular levels) one of the most important reasons for contradiction is how to integrate a single model, regardless of its origin (global/specific or particular), in an interconnected world where every single model must be linked with at least the rest of the single models related to the same subject (science, discipline, activity, in rational hypothesis at global/specific level), thing or being (global/specific and/or particular rational hypothesis affecting the same thing or being).

If we have a rational hypothesis about a possible earthquake in Santiago de Chile with possible replicas in San Francisco, a rational hypothesis about the phenomenon El Niño causing possible hurricanes in the Caribbean Sea and much more concretely, a hurricane in Miami, and the airport of Panama city is on alert because of a possible accident, how all this information, and all the rational hypotheses related to, could be integrated in the current global model, interconnecting all the single models in the global model, in order to make further decisions in the third stage of the Modelling System, such as decisions about how to divert all flights to Santiago de Chile, San Francisco, Miami, Panama City, towards other places.

Establishing accurate interconnections between models is crucial for minimising contradictions and ensuring coherent decision-making.

In the fourth rational check, along with all possible contradictions because of a lack of comprehensiveness, is really important the detection of any contradiction between single models due to a lack of sufficient interconnections between rational hypotheses, in order to automate the mechanism of linking single models as soon the single models arrive in the global model.

And once the fourth rational check has confirmed that there is no contradiction between all the single models already integrated into the global model, the fifth rational check, the most important, must check, in the actual model, if the values expected by the global model for every factor in the factual hemisphere, correspond, within a margin of error, to the real value of every factor in the flow data in the factual hemisphere in the matrix: the fifth rational check in the actual model tries to confirm that the real data for every factor in the factual hemisphere, within a margin of rational doubt, is within the expected values for every factor in the global model.

At any time that in the fifth rational check is found out that the real data, from the factual hemisphere, for any factor, does not correspond, beyond a margin of rational doubt, to the expected values for this factor, in the global model, there must be research about the reasons behind this contradiction, in order to fix the problem.

Some reasons behind contradictions between real data and expected values in the actual model in the fifth rational check could be: 1) in reality there have been some recent changes not registered yet in the rational truth, so the rational hypothesis should be updated according to the new changes in the relations of its factors in the mathematical equation, 2) the way in which the single models were interconnected each other in the global model was totally or partially wrong, 3) there is a problem in the pure reason, 4) problems in the measurements taken by the robotic devices, sending wrong information to the factual hemisphere in the matrix, etc.

Once any problem in the global model has been fixed, thanks to the fifth rational check, after five rational checks, the global model is reliable enough to make a prediction, so the next model is the global prediction virtual model. In other words, the global model in the

future upon the possible predictions given the current mathematical equations in the present global model.

If we can create the future global model upon possible predictions given the mathematical equations behind the present global model, the same mathematical equations are possible to model the possible evolution from the present global model to the future global model. What is going to be the global evolution virtual model, the virtual evolution from the current global model to the predicted global model.

The global evolution virtual model is the sequence of predicted values per factor according to the mathematical equations used in the prediction. If, for every single moment from now onwards, we can predict the expected values for every factor in the global model until the foreseeable future, the global evolution virtual model is the dynamic representation of such evolution of the predicted values for each factor from the current global model to the foreseeable future.

Once the global evolution virtual model has made a prediction for every value for every factor in each moment from now on to some specific future point, the global evolution actual model is going to be a synthesis between the global evolution virtual model and the real values that each factor is going to have during that evolution.

If during the evolution, there is a contradiction, beyond the margin of rational doubt, between the expected values of any factor in any moment of this evolution, and the real values of this factor in the flow of data in the factual hemisphere, as long as the evolution evolves, all contradiction beyond the margin of doubt is enough evidence to study what is going on in the rational hypothesis related to that expected values, for that factor, during the evolution.

The sixth rational check is that check, in the global evolution actual model, checking at any time in any single moment the real data flowing in the factual hemisphere in the matrix for every factor during the evolution, and the expected values for each factor according to the mathematical equations in which this evolutionary model is based on. Doing as many researches are necessary when the real data of any factor, beyond the margin of error, is not according to the expected values, in order to identify the source of error: 1) rational hypothesis not updated, 2) wrong mathematical evolution, 3) wrong attribution of pure reason to the data in the

rational hypothesis, 4) wrong interconnections of the previous single model when it was included in the global model, 5) possible problems in the robotic devices sending measurements to the factual hemisphere in the matrix, etc.

And as long as the evolution is evolving towards the prediction point, the seventh rational check in the global prediction actual model is the rational check between the expected values in the prediction model and the real values in the factual hemisphere of the matrix, as long as the prediction point is coming, for every factor involved, checking if the real values are, within a margin of rational doubt, according to the expected values, and in case that the real values are not within, the research of the sources of error to find out why the prediction was totally or partially wrong: 1) rational hypothesis not updated, 2) wrong mathematical prediction, 3) wrong attribution of pure reason to the data in the rational hypothesis, 4) wrong interconnections of the previous single model when it was included in the global model, 5) possible problems in the robotic devices sending measurements to the factual hemisphere in the matrix, etc.

The only rational check that does not take place in the Modelling System is the first rational check, responsible for the rational criticism in the deductive program, to demonstrate if an empirical hypothesis is rational according to the critical reason, and if rational, to include, by the deductive program, the rational hypothesis in the corresponding file, of this deductive program, in the rational truth.

The first rational check is not in the Modelling System and, at the same time, is quite different to the rest of the rational checks. The main purpose of the first rational check, and for that reason to be integrated into the critique of the pure reason, is to find out if the attributional operation made by the deductive program attributing the correct pure reason (between all the pure reasons in the list of pure reason, as it was explained in the post "The artificial method for the scientific explanation") to some data, is a correct attribution. If in the rational criticism is found out in the first rational check that a deductive program at the first try is not identifying the pure reason behind some data correctly, and for that reason, many empirical hypotheses are wrong in the rational contrastation, in order to secure a perfect function of this deductive program, should be investigated by the Learning System to find out why this deductive program is committing a high rate of mistakes of pure attributions at first try, when it has to attribute the correct pure reason to some data.

In the attribution of a pure reason to some data there are many strategies, one of them by trial and error, but it would be very desirable that deductive programs, not by trial and error, but analysing carefully the data, mathematically could automatically attribute the correct pure reason to some data only using artificial analytical reasoning: comparing the behaviour of the data according to the list of pure reasons, choosing only the right pure reason for that data since the beginning, since the very first try.

Once the seven models are done: single, global, actual, and the global prediction or evolution, virtual or actual, models; the next thing to do, is the rational comparison between the seven models made by the Modelling System in the Global Artificial Intelligence, and only in those common aspects, all those models made by the Modelling System in the particular programs.

Something really important to consider in the comparative methodology is the fact that it is only possible to compare two different objects or subjects when both of them have something in common. If there is nothing in common, there is no possible comparison. Only when two or more objects or subjects have something in common is comparison possible.

This remarkable first thing to consider is really important in the comparative methodology, because this means that only is possible to compare a single model made by the Global Artificial Intelligence and a single model by a particular program, if the single model in both has something in common, comparing only that thing in common, the rest is not possible to compare.

A model related to a replica in San Francisco, and another one about a hurricane in Miami, are incomparable. There is nothing in common.

But a model about the route of a flight, made by the control tower of an airport in Los Angeles tracking the route of a jet diverted from San Francisco to Los Angeles, and the model about this route made by the jet itself, and the model of this flight made by the Global Artificial Intelligence itself, as the three ones are related to the same thing, the same route, all of them are mutually comparable.

In this way, rational comparisons, comparing models made by different intelligences, programs, applications, related to the same thing or being, look like a triangulation, but more sophisticated, because much more than a triangulation, it is a geometrical analysis.

If in case of, simultaneously, a replica in San Francisco, hurricane in Miami, an accident in Panama City, is necessary to divert all the flights to these airports, looking for available airports in their respective area, at the same time, on the same thing, how to divert flights in a very busy day, much more like a triangulation process, is a geometrical process, in which every particular program, global/specific programs in the Global Artificial Intelligence, will formulate its respective models, to be later compared, to find any possible contradiction.

If the rational comparisons are going to look like geometrical comparisons in the sense that they are going to look like a triangulation process but much more sophisticated, the use of geometrical correlations since the beginning to define correlations between factors could make easy later to make the rational comparisons.

In short, the seven rational comparisons are comparisons between those models made by the Modelling System in the Global Artificial Intelligence and those made by the Modelling System in particular programs, comparing only those aspects in common, and the seven rational comparisons look like a triangulation process but more sophisticated, because in fact, it is a geometrization process.

A rational comparison is a rational geometrisation in order to compare two or more models, from different intelligences, systems, programs, simultaneously in those aspects in common.

The seven rational comparisons, as rational geometrisation of common aspects in two or more models, are:

- First rational comparison: the comparison of single models, based on global/specific rational hypotheses and/or particular rational hypotheses, if all the single models to compare have something in common, and only comparing those things in common.

- Second rational comparison: the comparison of all those aspects in common between the global model (the global comprehensive virtual model by the Modelling System in the Global Artificial Intelligence) and as many particular models (particular comprehensive virtual models made by the Modelling System in particular programs) that can have something in common.

- Third rational comparison: the comparison of all those aspects in common between the actual model (the global comprehensive actual model by the Modelling System in the Global Artificial Intelligence) and as many particular actual models (particular comprehensive actual models by the Modelling System in particular programs) that can have something in common.

- Fourth rational comparison: the comparison of all those aspects in common between the global prediction virtual model and as many particular prediction virtual models as can have something in common.

- The fifth rational comparison: the comparison of all those aspects in common between the global evolution virtual model and as many particular evolution virtual models that can have something in common.

- The sixth rational comparison: the comparison of all those aspects in common between the global evolution actual model and as many particular evolution actual models that can have something in common.

- The seventh rational comparison: the comparison of all those aspects in common between the global prediction actual model and as many particular prediction actual models that can have something in common.

Rational comparisons must be made permanently, at any time that a new rational hypothesis is transformed into a single model, analysing the impact of this new incorporation in the rest of the models, as well as, at regular intervals, routine comparisons.

The importance of the seven rational comparisons is because the main difference between global/specific rational hypotheses and particular rational hypotheses, is the fact that global/specific rational hypotheses are more comprehensive, while particular rational hypotheses are more accurate, so the balance between comprehensiveness and accuracy needs a permanent track comparing global/specific developments and particular developments to compensate any possible maladjustment between global/specific and particular developments, to secure the goodness, harmony, and rationality, in the models.

Finally, at any time that in the seven rational checks and the seven rational comparisons, an error associated with the pure reason is found, it must be included in the frequency of wrong rational hypotheses of its respective pure reason in the critique of the pure reason, and it must be included as a wrong hypothesis in the respective critique of the deductive program responsible for its attribution, in order to identify what pure reasons or what deductive programs are making more mistakes, in order to fix them.

The critique of pure reason as a program is: 1) a database where per pure reason is one file per rational check or comparison, 2) where to account for the frequency of wrong rational hypotheses because of a problem related to the pure reason, 3) those pure reasons with the highest frequency of wrong rational hypotheses, should be analysed by Learning System to find out the source of error to fix.

The critique of the deductive programs as a program: 1) a database where per deductive program is one file per rational check or comparison, 2) where to account the frequency of wrong rational hypotheses because of a wrong attribution of pure reason to the data made by the deductive program, 3) those deductive programs with the highest frequency of wrong attributions, should be analysed by the Learning System to find out the source of error to fix.

Ending up with the critique of the attributional operation, understanding for attributional operation all operations responsible for the attribution of: meaning (by application, matching measurements to categories), pure reason (by deduction, matching pure reasons to data), applications (in the Application System, matching instructions to the correct application in accordance with their purpose).

The critique of the attributional operation is a program working as follow: 1) a database including all systems, specific/global deductive programs, particular programs, and applications, 2) where to account for the frequency of wrong attributions in their respective responsibility (attribution of meaning, pure reason, application), 3) identifying the ones with the highest frequency of mistakes to fix.

In order to fix those attributional operations in any intelligence, system, program, application, in which there are some attributional operations with frequencies of wrong attributions beyond the critical reason, is important that firstly the Learning System must analyse carefully what a common thing or common things there is or there are behind all the mistakes made by an intelligence, system, program, application, contrasting the common mistake/s and the mathematical structure behind the logic of set theory in which the attribution was made, to find out which is the real reason behind the set theory in this intelligence, system, program, application for what the attribution was wrongly made, in order to fix it.

Once the Learning System can get the real reason behind the mistake/s, and has proposed a decision to fix this intelligence, system, application, or program, decision to be authorised by the Decisional System, if authorised, the Artificial Engineering in the Application System is the responsible to fix that intelligence, system, application, or program, following the sequence of instructions in which the decision has been transformed into.

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